IBM

Transition to IBM Business Process Manager Advanced V7.5 for Developers

(Course code WB754 / VB754)

Lab Setup Guide for
Classroom Delivery

ERC 1.0

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IBM | **Training**

WebSphere Education

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Purpose

This **Lab Setup Guide** provides directions for installing, preparing, and verifying the lab hardware and software in preparation for conducting a class of course WB754 / VB754.

The Requirements sections of this document may also be used to determine the specific hardware and software needed to conduct a class.

Lab setup guide overview

The purpose of this lab setup guide is to assist the classroom preparer in setting up the WB754 / VB754 classroom lab environment. This guide is separated into two parts:

- "Setting up the lab environment using a VMware image" on page 3
- "Creating the lab environment manually (non-VMware)" on page 19

The classroom preparer needs to complete only one of these parts to complete the classroom lab environment.

! Important

It is recommended that you attempt to use the VMware image. If a manual installation is required, contact a WebSphere Education representative beforehand to discuss this solution.

Keep in mind that the instructor does not have sufficient time to manually install the software needed for the lab exercises if the classroom is not properly prepared for the first day.

Setting up the lab environment using a VMware image

For an instructor-led training (ILT) classroom delivery, the classroom preparer is responsible for preparing:

Instructor or student workstation	How many workstations	Per how many students	Notes
instructor	one	n/a	The instructor may use this machine for lectures and to demonstrate using the VMware image.
student	one	one	One computer for each student

Each student workstation and the instructor workstation host a VMware virtual machine, preconfigured for the lab exercises.

The following tables list the hardware, software, and network requirements needed to set up a lab to support course WB754 / VB754.

Hardware requirements

This section lists the recommended hardware requirements for a student workstation.

Tier code	Processor type and speed	Minimum memory	Minimum free hard disk space	Display resolution
65	Intel Pentium 4 2.8 GHz or faster	3.0 GB	40 GB	1024 x 768 pixels

> **! Important**
>
> Ensure that all nonessential software installed on the workstation is set to *not* start automatically. The memory requirement assumes that the host operating system requires no more than 512 MB of memory and all of the remaining memory is available to the VMware image.
>
> If you are unsure whether your classroom environment meets the specified hardware requirements, **contact your WebSphere Education representative** immediately. The performance of the lab exercises is severely affected if the classroom systems do not meet the stated requirements.

Software requirements

This section lists the software needed to prepare the lab environment. When preparing for a class, be sure that you have the correct number of licensed copies of any non-IBM software.

Software product	Version	Licensing requirement
Microsoft Windows XP Professional	Service Pack 3 or greater	Site must provide sufficient licenses for private offerings.
VMware Player	2.5.3	Site must satisfy the end-user license agreement.

> **!** **Important**
>
> Ensure all nonessential software installed on the workstation is set to *not* start automatically. If nonessential software is running, performance problems may be caused because there may be insufficient memory available to support both the host operating system and VMware image.
>
> VMware Player version 2.5.3 is supported.
>
> Administrator-level privileges are required to install the VMware Player software.

Network requirements

This section specifies the network requirements for the lab environment.

Network connectivity required	No
Internet connectivity required	No
DHCP required	Yes — for host machine (not VMware image); you may also use the loopback adapter.
Fixed IP addresses required	No

Skills required to set up the lab

The following specialized skills are required by the classroom preparer to set up the lab environment:

- Install Windows applications on Microsoft Windows XP Professional
- Verify user access rights on Microsoft Windows XP Professional
- Configure network adapter drivers on Microsoft Windows XP Professional

Classroom preparation process overview

```
┌─────────────────────────────────┐
│   Begin classroom preparation   │
└─────────────────────────────────┘
                │
                ▼
         ╱ Does ╲
        ╱ the classroom have ╲              ┌───────────────────────────┐
       ╱ sufficient computers meeting the ╲─── No ──▶│ Contact your WebSphere    │
        ╲ hardware and software ╱          │ Education representative   │
         ╲ requirements? ╱                 │ immediately.              │
                │                          └───────────────────────────┘
              Yes
                ▼
         ╱ Do ╲
        ╱ you have ╲                        ┌───────────────────────────┐
       ╱ sufficient administrative-level ╲─── No ──▶│ Contact your WebSphere    │
        ╲ access on each ╱                 │ Education representative.  │
         ╲ workstation? ╱                  │ You might need to         │
                │                          │ perform a manual          │
              Yes                          │ software installation.    │
                ▼                          └───────────────────────────┘
         ╱ Are ╲
        ╱ you able to ╲                     ┌───────────────────────────┐
       ╱ install the VMware Player ╲─── No ──▶│ Contact your WebSphere    │
        ╲ software ╱                        │ Education representative.  │
         ╲ successfully? ╱                  │ You might need to         │
                │                          │ perform a manual          │
              Yes                          │ software installation.    │
                ▼                          └───────────────────────────┘
         ╱ Are you ╲
        ╱ able to uncompress ╲              ┌───────────────────────────┐
       ╱ and verify the virtual machine ╲─── No ──▶│ Contact your WebSphere    │
        ╲ image for this ╱                 │ Education representative.  │
         ╲ course? ╱                       │ You might need to         │
                │                          │ perform a manual          │
              Yes                          │ software installation.    │
                ▼                          └───────────────────────────┘
┌─────────────────────────────────┐
│  Classroom preparation complete │
└─────────────────────────────────┘
```

Workstation setup overview

The following classroom setup instructions are separated into the following sections:

- Section "Preparing the base workstations" on page 6: This section describes how to configure the physical (host) student workstations with the proper operating system, network, and software settings.

- Section "Installing VMware Player" on page 8: This section describes how to download, install, and configure VMware Player.

- Section "Installing the VMware images" on page 12: Describes how to extract, load, and verify the virtual (guest) student computing environment. The guest system runs as a virtual computer on the physical, host system.

Note

If you need additional information about virtual machines, see "Appendix. Introduction to virtual machines" on page 31, which provides an introduction to the concept of virtual machines and the VMware player application.

Accessibility considerations

If the class is being attended by a blind student, then that student's workstation needs to have a screen reader, such as JAWS, installed. The JAWS application also needs to be installed within the VMware image running on the workstation. In addition, the student machine needs to have a sound card installed, the speaker needs to be activated, and the student needs to be provided with a headset.

Preparing the base workstations

General lab environment information

The ideal lab environment is to have all student workstations connected to the same LAN with TCP/IP correctly configured so that workstations can connect to each other using their host names.

If no LAN adapter is available, configure the Microsoft Loopback Adapter as the default LAN adapter with a private TCP/IP address so that the TCP/IP stack is active.

Refer to the Microsoft Knowledge Base for information about how to configure this option.

Operating system setup instructions

Ensure that the operating system is set up correctly:

__ 1. Ensure that the operating system listed in the software requirements section is installed.

__ 2. Ensure that the local user account has sufficient administrator-level privileges to install the VMware Player application.

    __ a. From the Windows Start menu, open **Control Panel > Administrative Tools > Computer Management**.

    __ b. In the Computer Management console, expand **Computer Management (Local) > System Tools > Local Users and Groups > Users**.

    __ c. Double-click the user account that is currently logged in.
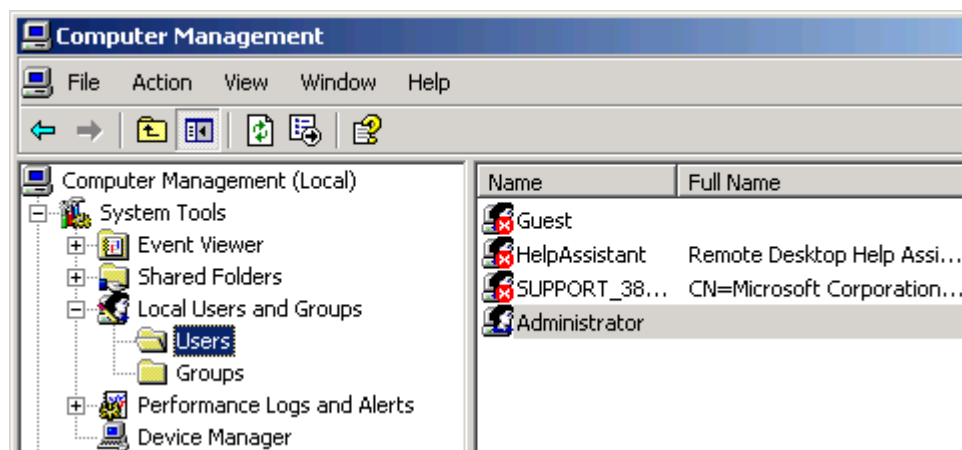
    __ d. In the user properties window, switch to the **Member Of** tab.

    __ e. Verify that the currently logged in user account is a member of an administrator-level user group.
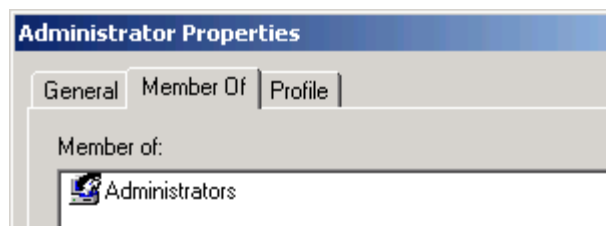
    __ f. Close the user properties window and the Computer Management console.

Note

Contact the computer network administrator to determine the user access rights available to students on each classroom computer. Most corporations enforce network domain policies to restrict access privileges on each individual desktop computer. You might have to request administrator-level access in order to install additional software on each computer.

Keep in mind that local administrator-level access is overridden by group security policies on the domain controller.

For more information, review the Windows XP Professional product documentation on user accounts:

```
http://www.microsoft.com/resources/documentation/windows/xp/all/
proddocs/en-us/usercpl_overview.mspx
```

Installing VMware Player

Perform the following steps to download, install, and configure VMware Player on each student and instructor workstation.

Note

WebSphere Education courses require **VMware Player version 2.5.3**.

__ 1. Download the VMware Player software from the VMware product page. The steps shown are for version 2.5.3.

    __ a. Open a new web browser window.

    __ b. Navigate to the following web address:
       ```http://www.vmware.com/download/player/download.html```

__ c.   Click the **Download** link for **VMware Player 2.5.3, build 185404**.

__ d.   Review the end-user license agreement. If you do not accept the license, you cannot proceed with the lab setup.

__ e.   Download a copy of the product to each student workstation and instructor workstation.

__ 2.   Install the VMware Player application. The steps listed are for version 2.5.3.

__ a.   Double-click the `VMware-Player-2.5.3-185404.exe` self-extracting archive.

__ b. When the VMware Player installation wizard appears, click **Next**.

__ c. Review the end-user license agreement. If you do not accept the license, you cannot proceed with the lab setup.

__ d. Leave the destination folder to the default setting of
    `C:\Program Files\VMware\VMware Player` and click **Next**.

__ e. Leave the configure shortcut settings to the default of **Desktop**, **Start Menu Programs folder**, and **Quick Launch toolbar**. Click **Next**.

___ f. In the configure product page, clear the **Enable the Google searchbar** check box. Click **Next**.
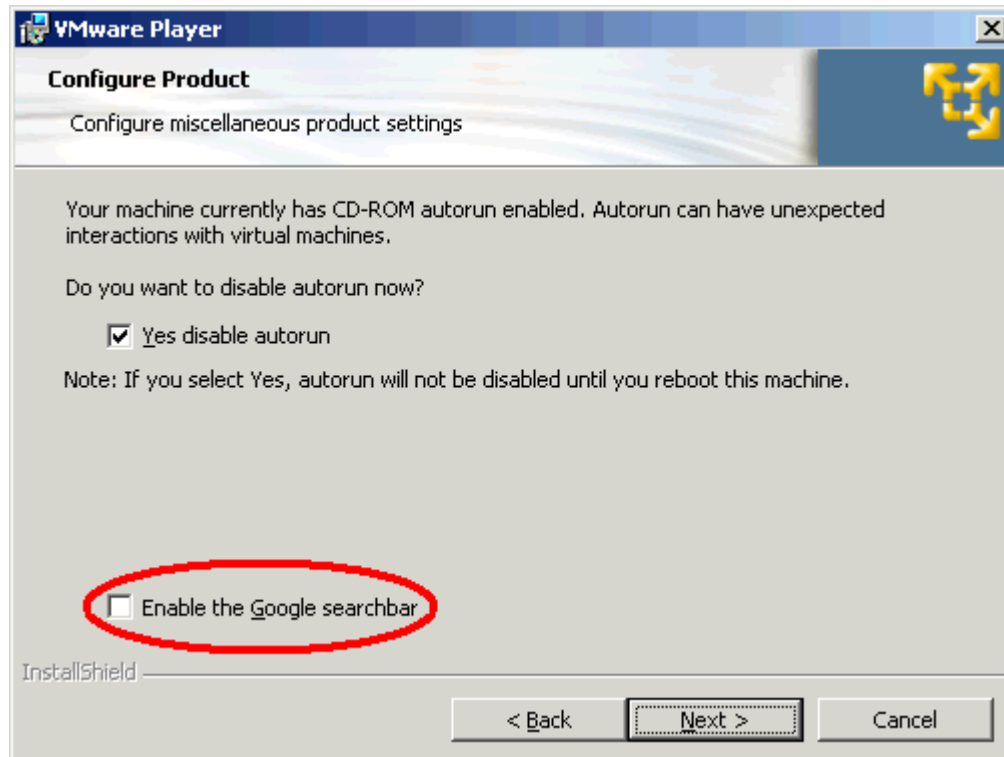
___ g. Click **Install** to proceed with the installation. The installation process might take 5–10 minutes to complete.

___ h. Verify that no error messages appear during product installation.

___ i. Click **Finish** to close the installer.

ℹ️ Information

VMware Player installs additional network drivers in order to perform network address translation (NAT) and bridged networking. If you do not have administrator-level privileges on the current Microsoft Windows operating system, the installation might fail at this point.
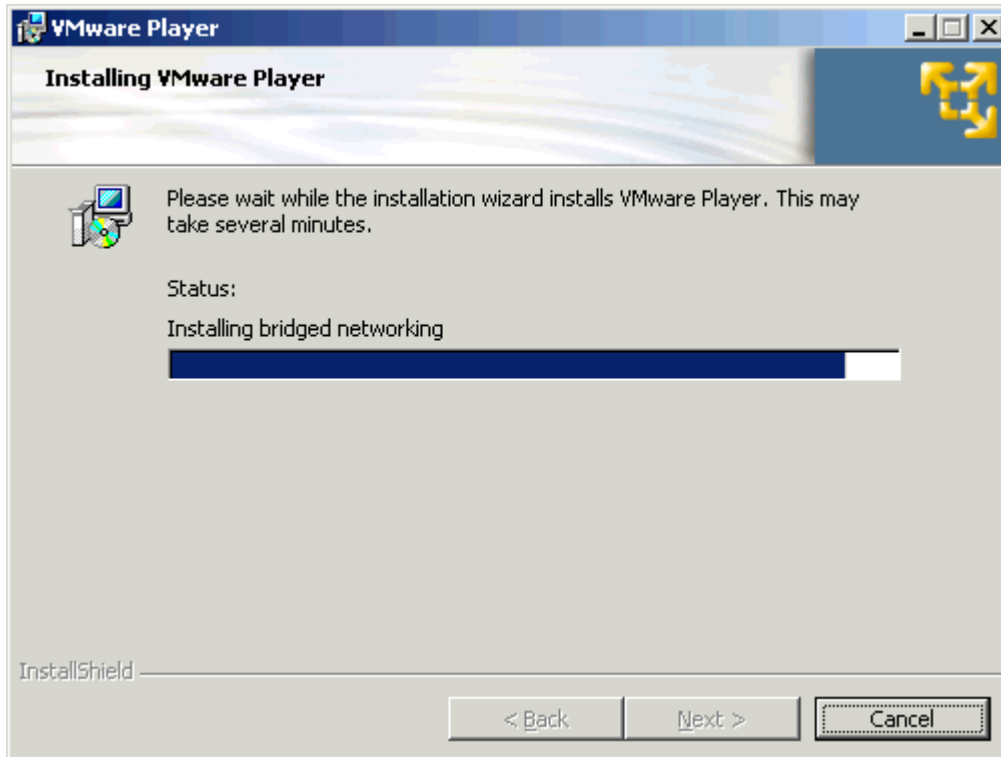
Installing the VMware images

This course uses a preconfigured computer environment, supplied by IBM WebSphere Education. The VMware virtual machine, also known as a virtual machine image, represents a self-contained computer running on your student workstation. This configuration eliminates the need for your classroom preparer to install course-specific software.

📝 Note

For a quick introduction to VMware virtual machines, consult "Appendix. Introduction to virtual machines" on page 31.

Image information

To download the VMware image for this course, go to `http://catalog.atlanta.ibm.com` and search by course code or title.

VMware virtual machine image setup for downloaded files

If you downloaded the virtual machine image files, perform the following steps to extract the VMware virtual machine image to each student workstation.

__ 1. From the downloaded files, extract the virtual machine files to the student workstation.

    __ a. Run the self-extracting archive file, with the `.exe` extension.

    __ b. When prompted, accept the default directory for the destination of the image files on the hard disk drive.

    __ c. Start the application to extract the virtual machine image files to the hard disk drive.

__ 2. At the conclusion of this process, the VMware image is built on the `C:\vmwareimages` directory.

VMware virtual machine image setup from disc media

If you have received a set of CD-ROM or DVD-ROM discs, perform the following steps to extract the VMware virtual machine image to each student workstation.

> **ℹ Information**
>
> 7-Zip is an open source file archive utility with support for various formats, including `.zip` and `.7z` files. VMware virtual machine images are compressed into 7-Zip multi-part archives. The archive files have the following naming convention:
>
>   *image_name*`.7z.001`
>   *image_name*`.7z.002`
>   *image_name*`.7z.003`
>   `...`
>
> After copying all parts of the multi-part archive into a temporary directory on the hard disk drive, use the 7-Zip utility to extract the files.

__ 1. Install the 7-Zip utility.

    __ a. Open a new web browser window to: `http://www.7-zip.org/download.html`

    __ b. Download the appropriate version of the 7-Zip utility for the workstation operating system.

___ c. Launch the 7-Zip installation program. Install the application using the default values.

___ 2. From each CD-ROM or DVD-ROM disc, copy all `.7z.0xx` files to a temporary directory on the hard disk drive.

___ 3. Test the virtual machine files on the student workstation.

___ a. Launch the **7-Zip File Manager** utility.

___ b. Navigate to the temporary directory with the `.7z` archive files.
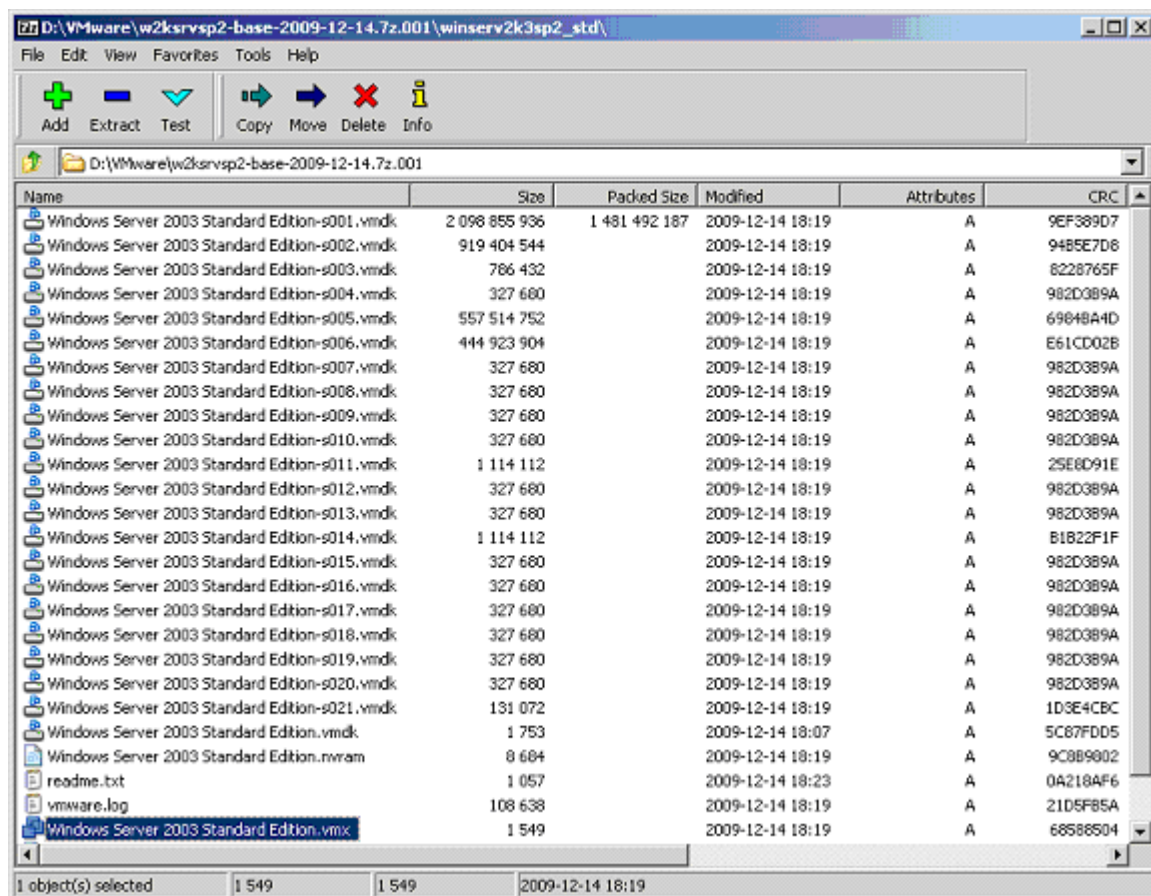
___ c. Double-click the first 7-Zip archive file, with the extension `.7z.001`.

___ d. From the main toolbar, select **Test**.

___ e.   Wait until the testing is complete.
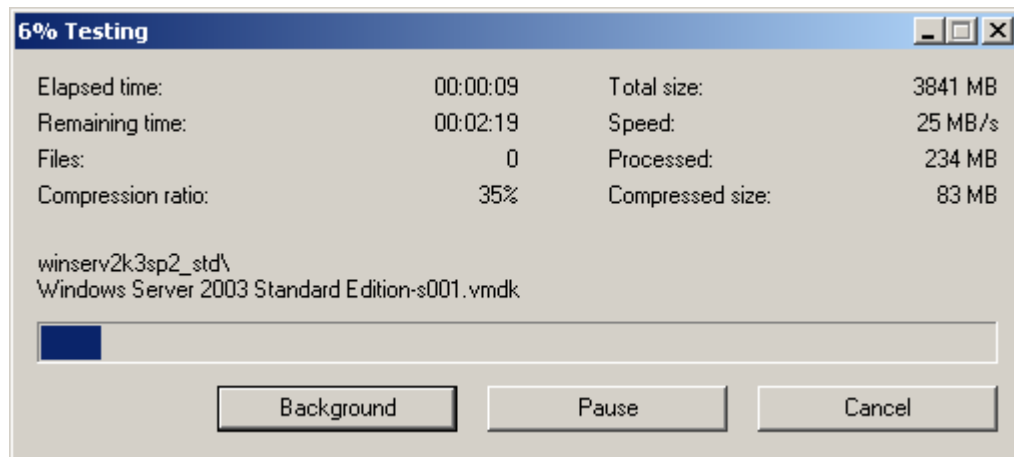
___ f.   Confirm that the archive has no errors.
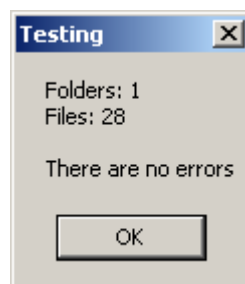
___ 4.   Extract the virtual machine files to the student workstation.

___ a.   Select **Extract** from the main toolbar.

___ b.   Enter `C:\vmwareimages\` as the target directory for the extracted files.
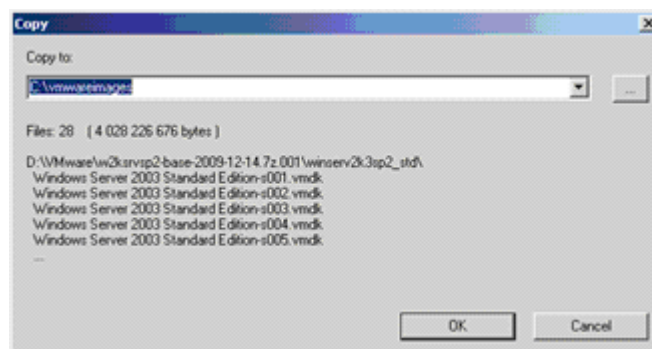
___ c.   Click **OK**.

___ d.   Confirm that no errors occurred during the extraction process.

Image customization and environment settings

Perform the following steps after loading the VMware virtual machine image to each workstation.

No customization steps are required.

Verification procedures

Use the following information to verify the installation and configurations of the student and instructor systems.

__ 1.   Start the virtual machine with VMware Player.

   __ a.   From the Windows Start menu, select **Programs > VMware > VMware Player**.

   __ b.   In the **Browse for virtual machine configuration file** dialog, navigate to the directory where you extracted the virtual machine files (if you selected the default directory, then it is `C:\vmwareimages`).

   __ c.   Select the `.vmx` file and click **Open**.
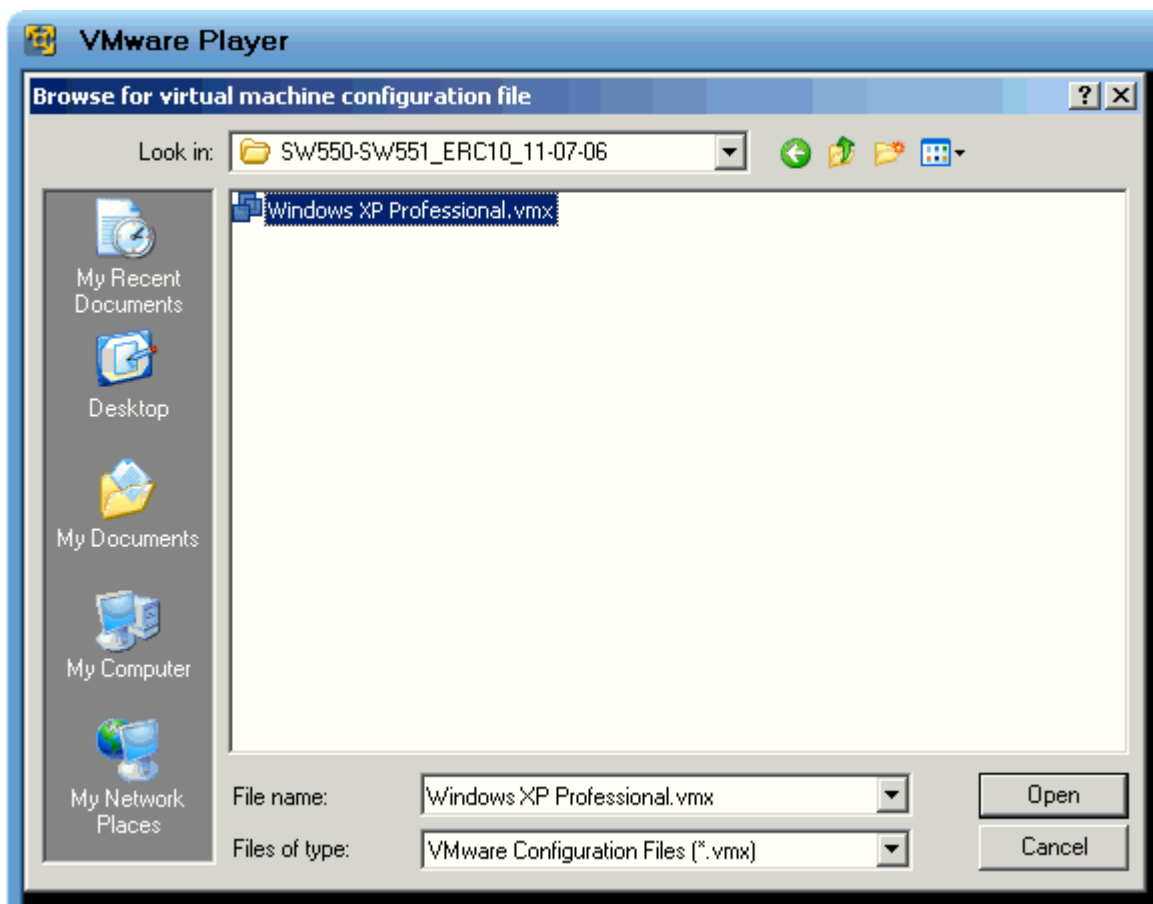
   __ d.   Wait until the Windows logon screen appears in the virtual machine.

   __ e.   Log on to Windows using the following:

   - User name: `Administrator`

   - Password: `web1sphere`

   __ f.   Make sure that the Windows desktop appears without any errors.

__ 2.   Verify that the virtual machine has been assigned a proper IP address.

__ a.   Within the virtual machine, select **Run** from the Windows Start menu. Make sure that you are performing this task within the virtual machine (guest system) and not the physical workstation (host system).
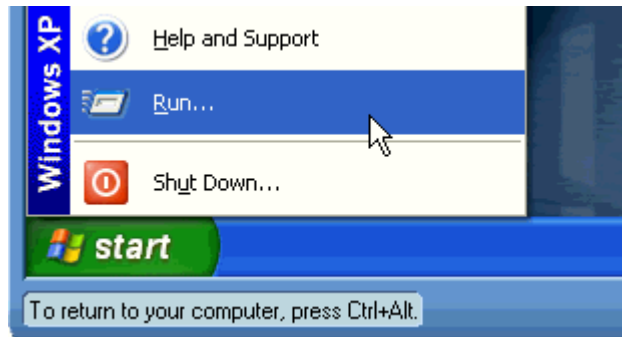
__ b.   Enter `cmd` in the Run dialog.

__ c.   Click **OK** to continue.

__ d.   When the Windows command prompt appears, type `ipconfig` to list all network devices configured within the virtual machine. Press Enter.

__ e.   Verify that the **Local Area Connection** Ethernet adapter has received an IP address.

   •   For virtual machines using **Network address translation**, ensure that the IP address is in the private IP range of `192.168.x.x`.

   •   For virtual machines using **Bridged networking**, ensure that the IP address is in the same range as the physical workstation (host system).

Verifying the input language and keyboard layout

Perform the following steps to ensure that the virtual machine is set to the correct input language and keyboard layout.

__ 1.   Click **Start > Control Panel > Regional and Language Options**.

__ 2. Select the **Languages** tab.

__ 3. Click **Details**.

__ 4. Verify that the default input language corresponds to your keyboard layout.

__ 5. If required, change the default input language and keyboard layout to the correct values.

Optimizing the memory allocation setting for the virtual machine

If possible, increase the memory allocation of the virtual machine to enhance performance. To do so, perform the following steps:

__ 1. In the VMware Player menu bar, select **Player > Troubleshoot > Change Memory Allocation**.

__ 2. In the Memory dialog, adjust the amount of memory allocated to the virtual machine based on the total amount of physical memory available. For example, if you have 3 GB of physical memory, allocating 2 GB to the virtual machine is recommended.

__ 3. Click **OK** to accept the changes.

__ 4. VMware Player reminds you that the memory allocation settings take effect upon system reset. Click **OK** to close the dialog.

__ 5. Reset the virtual machine to apply the memory allocation changes. In the VMware Player menu bar, select **Player > Troubleshoot > Reset**.

Hint

To access Windows Task Manager from the VMware image, press Ctrl+Alt+Insert.

STOP Stop

You have completed the installation and customization of the lab environment using a VMware image.

Creating the lab environment manually (non-VMware)

The following section provides information about how to manually create the lab environment that is needed to conduct the lab exercises in this course.

Perform the manual lab setup under the following conditions only:

- You are not allowed to install the VMware Player.
- You tried to perform the lab setup using the VMware image, and you were unable to successfully install the VMware Player software on the student or instructor workstation.
- Verification of the virtual machine image settings, including network connectivity, failed.

> **!** **Important**
>
> Contact your WebSphere Education representative before attempting to perform these steps.

For an instructor-led training (ILT) classroom delivery, the classroom preparer is responsible for preparing:

Instructor or student workstation	How many workstations	Per how many students	Notes
instructor	one	n/a	The instructor may use this machine for lectures and to demonstrate using the VMware image.
student	one	one	One computer for each student

The following tables list the hardware, software, and network requirements needed to set up a lab to support course WB754 / VB754.

Hardware requirements

This section lists the recommended hardware requirements for a student workstation.

Tier code	Processor type and speed	Minimum memory	Minimum free hard disk space	Display resolution
65	Intel Pentium 4 2.8 GHz or faster	3.0 GB	40 GB	1024 x 768 pixels

> **!** **Important**
>
> If you are unsure whether your classroom environment meets the specified hardware requirements, **contact your WebSphere Education representative** immediately. The performance of the lab exercises is severely affected if the classroom systems do not meet the stated requirements.

Software requirements

This section lists the software needed to prepare the student lab environments. When preparing for a class, be sure to have the correct number of licensed copies of any non-IBM software.

Software product	Version	Licensing requirement
Microsoft Windows XP Professional	Service Pack 3 or greater	Site must provide sufficient licenses for private offerings.
IBM Integration Designer WTE	7.5	Site must satisfy the end-user license agreement.
IBM Process Center	7.5	Site must satisfy the end-user license agreement.
IBM Business Rules Manager	7.5	Site must satisfy the end-user license agreement.
Mozilla Firefox	3.5	Site must satisfy the end-user license agreement.
Adobe Flash Player	most recent	Site must satisfy the end-user license agreement.
IBM Forms Viewer	3.5.1	Site must satisfy the end-user license agreement.
Adobe Reader	most recent	Site must satisfy the end-user license agreement.

Network requirements

This section specifies the network requirements for the lab environment.

Network connectivity required	No
Internet connectivity required	No
DHCP required	Yes — for host machine (not VMware image); you may also use the loopback adapter

Fixed IP addresses required	No

Skills required to set up the lab

The following specialized skills are required by the classroom preparer to set up the lab environment:

- Install Windows applications on Microsoft Windows XP Professional
- Verify user access rights on Microsoft Windows XP Professional
- Configure network adapter drivers on Microsoft Windows XP Professional
- Install IBM Business Process Manager V7.5 Advanced for Windows

Setup instructions

General lab environment information

The ideal lab environment is to have all student workstations connected to the same LAN with TCP/IP correctly configured so that workstations can connect to each other using their host names.

If no LAN adapter is available, configure the Microsoft Loopback Adapter as the default LAN adapter with a private TCP/IP address so that the TCP/IP stack is active.

Refer to the Microsoft Knowledge Base for information about how to configure this option.

Operating system setup instructions

Perform the following steps to install and customize the base operating system.

__ 1. Follow the instructions in the documentation provided with the Windows XP Professional operating system. There are no specific operating system installation requirements for this course.

__ 2. Use Windows Update to install Windows XP Professional, Service Pack 3, and any required system updates.

Software setup instructions

Perform the following steps to install and customize software that is required in addition to the operating system.

Part 1: Install IBM Process Center V7.5

Download the IBM Process Center 7.5 and IBM Process Manager Advanced 7.5 runtime installation files from Passport Advantage.

The installation of IBM Process Center can be performed by using installation media or by using downloaded software. If you download the installation files from Passport Advantage, each of the WebSphere Integration Developer archives must be extracted into the **same directory**.
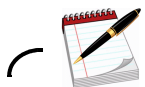
Note

No special software is required to extract the installation files. The Windows Compressed (zipped) Folders utility is adequate for this task.

To install IBM Process Center:

__ 1. Log on Windows as `Administrator` or log on using an account that is a member of the Administrators group.

__ 2. Insert the installation media, or in Windows Explorer, navigate to the folder containing the installation files, for example, `C:\PC75\`.

__ 3. Double-click `launchpad.exe` to start the installation launchpad.

__ 4. Select **Install Process Center**.

Install IBM Business Process Manager Advanced V7.5

Select the type of server that you want to install.

⦿ Install Process Center

The Process Center is a shared development environment that is used to build p
The Process Center includes the Process Designer development tool.

○ Install Process Server

The Process Server is the location where process applications are deployed.

__ 5. Click **Next**.

__ 6. Enter the hostname and the path of the installation.

Install the Process Center

Specify basic information about the Process Center that you want to install.

1. Enter the name of the host:

    Hostname: localhost

2. Specify the location for the installation:

    Location: C:\IBM\BPM\v7.5   Browse...

__ 7. Select **Install an embedded DB2 Express database**.

Select database configuration

Select a database configuration. If you install an embedded DB:
be fully configured and ready to use.

⦿ Install an embedded DB2 Express database

◯ Use an existing database (DB2, MSSQL, or Oracle)

__ 8. In the **Installation summary** panel, accept the license agreement and click **Next** to begin the installation.

Installation summary

The following options will be installed. If this list is not correct, click **Back**

- Installing Process Center to C:\IBM\BPM\v7.5
- Installing Process Designer to C:\IBM\BPM\ProcessDesigner\v7.5
- Installing DB2 Express. Before you proceed, make sure that you do installed.

☑ I have read and accepted the <u>license agreement</u> and <u>notices</u>

__ 9. Wait for the installation to complete. It takes a while (possibly as long as a few hours). Do not hit **Cancel**. You can monitor the status bar that shows the percentage installed.
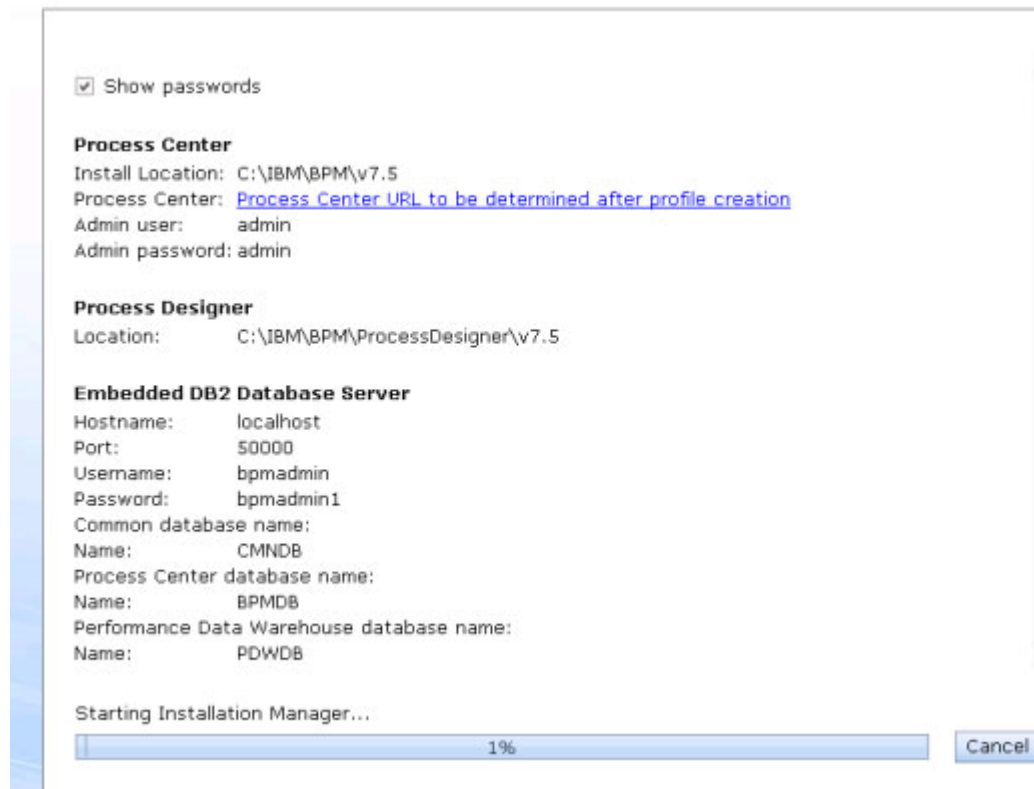
__ 10. Once the installation is complete, click **Exit** to close the Installation Manager.

Part 2: Installing the IBM Integration Designer WTE environment

Download the IBM Integration Designer 7.5 WTE files from Passport Advantage.

The installation of Process Center can be performed by using installation media or by using downloaded software. If you download the installation files from Passport Advantage, each of the WebSphere Integration Developer archives must be extracted into the **same directory**.

Installation of the IBM Integration Designer test environment is done using the installation launchpad.

To install the test environment:

__ 1. Double-click `launchpad.exe` to start the installation launchpad.

__ 2. Select the first option in the list: **IBM Integration Designer for IBM Business Process Manager Advanced - Process Server**.

__ 3. Click **Next**.

__ 4. Click **Continue** when asked to create a new package.

__ 5. At the installation packages panel, accept all the options except **IBM Business Monitor, IBM Cognos Business Intelligence, and IBM DB2 Express 32 bit**.
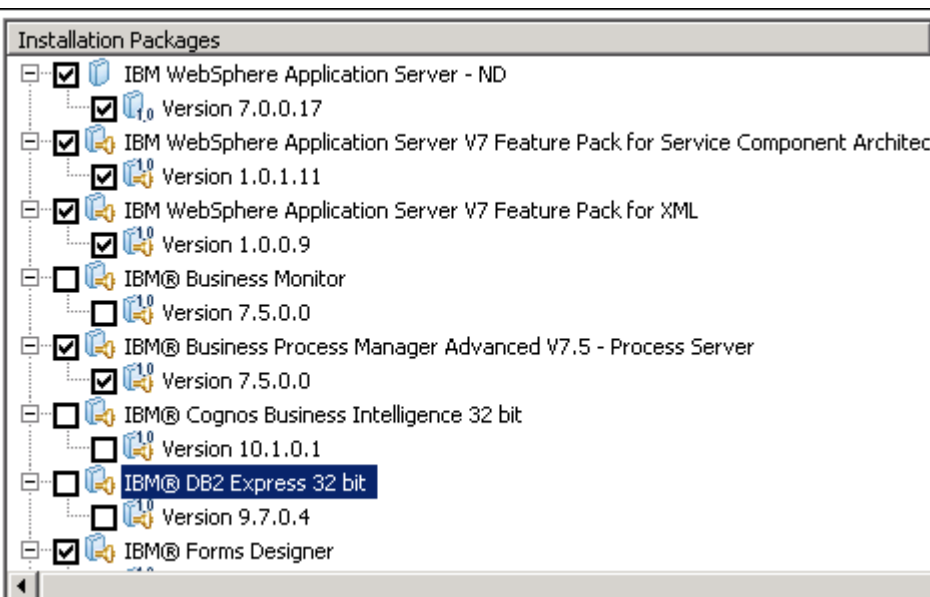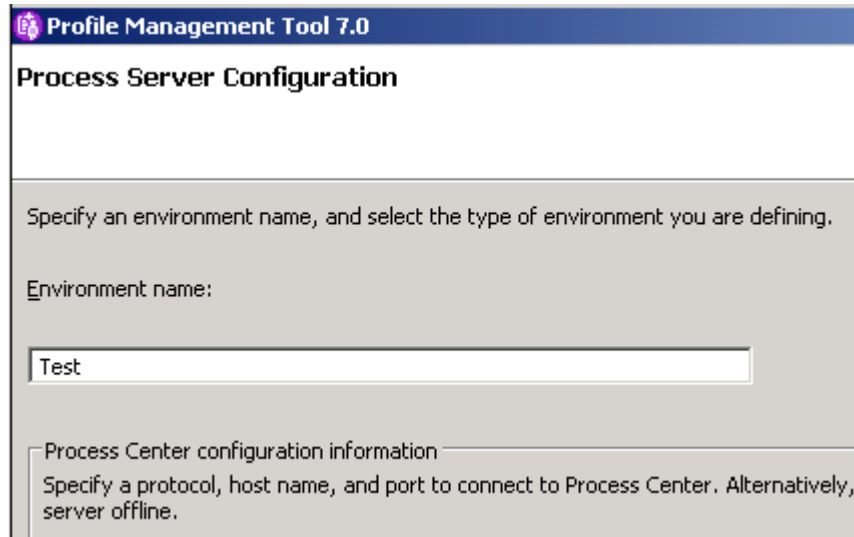
__ 6. Click **Next**.

__ 7. At the program license agreement panel, select **I accept the terms in the license agreements**.

__ 8. Leave the default paths selected and click **Next**.

__ 9. Once the installation is complete, click Next to launch the PMT.

__ 10. Click **Next**.

__ 11. In the PMT, click **Create** to create a profile.

__ 12. At the features panel, leave the default options selected.

__ 13. Click **Next**.

__ 14. In the **Profile Creations Options**, select **Typical profile creation** and click **Next**.
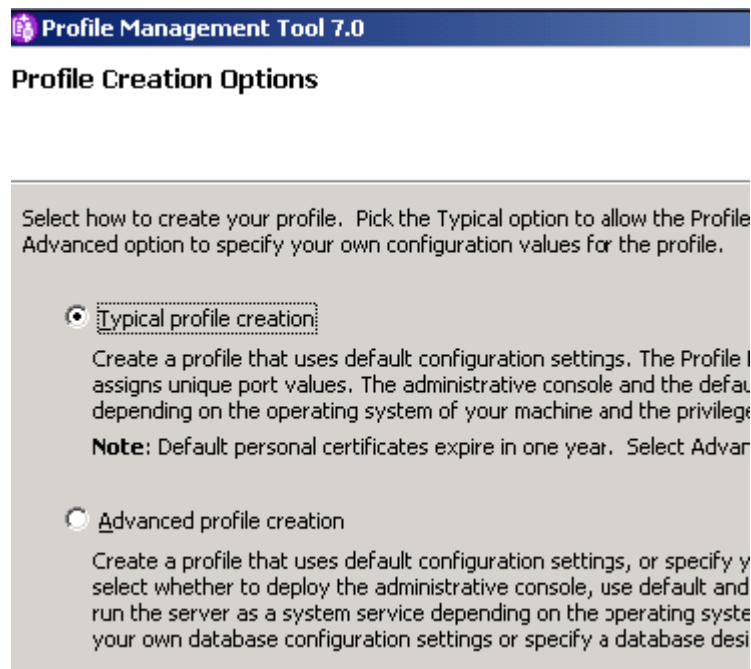
__ 15. Enter `admin` for the **user name** and **password** fields, and click **Next**.

__ 16. At the **Process Server Configuration** panel, enter `Test` for the **Environment name** and enter `localhost` for the **Host name** for Process Center.

> **Profile Management Tool 7.0**
>
> **Process Server Configuration**
>
> Specify an environment name, and select the type of environment you are defining.
>
> Environment name:
>
> `Test`
>
> Process Center configuration information
> Specify a protocol, host name, and port to connect to Process Center. Alternatively, server offline.

__ 17. Click **Next**.

__ 18. For database names, do not select the defaults since the database cannot be shared with the Process Center profile. Add a unique identifier at the end of each table space name to make it unique.

__ 19. Click **Next**.

__ 20. Click **Create**. Wait for the installation process to complete. It takes several minutes (depending on available hardware). Creating the server profile is the longest action. Do not cancel the installation.

__ 21. When the installation is complete, click Next to launch the First Steps console.

> **Profile Management Tool 7.0**
>
> **Profile Creation Complete**
>
> **The Profile Management Tool created the profile successfully.**
>
> The next step is to decide whether to federate the process server into a deployment ma
>
> To federate the process server, use either the **addNode** command or the administrative
> the process server to be running.
>
> You can start and stop the process server from the command lne or the First steps cons
> other information and features that relate to the process server.
>
> ☑ Launch the First steps console.

__ 22. Click **Exit** once the verification is complete. Close all open windows.

Part 3: Installing the solution and support files

The course environment depends upon a number of prebuilt support files. These files are necessary to complete the course exercises as they have been designed. WebSphere Education also offers a complete set of solution files, represented as project interchange files, which may be imported in to IBM Integration Designer.

Once you obtain the solution and support files from WebSphere Education:

___ 1. Create a directory in the host system root named **Support Files**; for example, `C:\Support Files`.

___ 2. Create another directory in the host system root named Solutions; for example, `C:\Solutions`.

___ 3. The solution and support files reside on the Instructor CD in the file `WB754_ERC1.0_LABFILES.ZIP`. Extract the contents of the solution and support files from the Instructor CD to the respective directories. Verify that each directory has a subdirectory corresponding to the exercise number (for example, `Ex4`, `Ex5`, and so on).

Accessibility considerations

If the class is being attended by a blind student, then that student's workstation needs to have a screen reader, such as JAWS, installed. The JAWS application also needs to be installed within the VMware image running on the workstation. In addition, the student machine needs to have a sound card installed, the speaker needs to be activated, and the student needs to be provided with a headset.

Verification procedures

Use the following information to verify the installation and configuration of the student or instructor lab environments.

___ 1. Start the IBM Process Center server.

___ 2. Launch IBM Process Designer, logging in with administrator privileges. IBM Process Center and IBM Process Designer have been installed correctly if you arrive at the Process Center perspective in IBM Process Designer.

___ 3. Stop the IBM Process Center server.

___ 4. Start the IBM Process Server server.

___ 5. Launch IBM Integration Designer. IBM Process Server and IBM Integration Designer have been installed correctly if you arrive at the default workspace for IBM Integration Designer.

___ 6. Stop IBM Process Server.

STOP **Stop**

This completes the manual installation and customization of the lab environment (non-VMware image).

Appendix. Introduction to virtual machines

The following section provides an introduction to the concept of virtual machines and the VMware Player application.

Preface

Virtual machines provide a separate, isolated computing environment as a computer program on your desktop. The virtual machine itself represents a complete computer system: when you power on the virtual machine, it starts a virtual computer with its own operating system. In effect, virtual machines allow you to operate two or more computers on a single computer workstation.
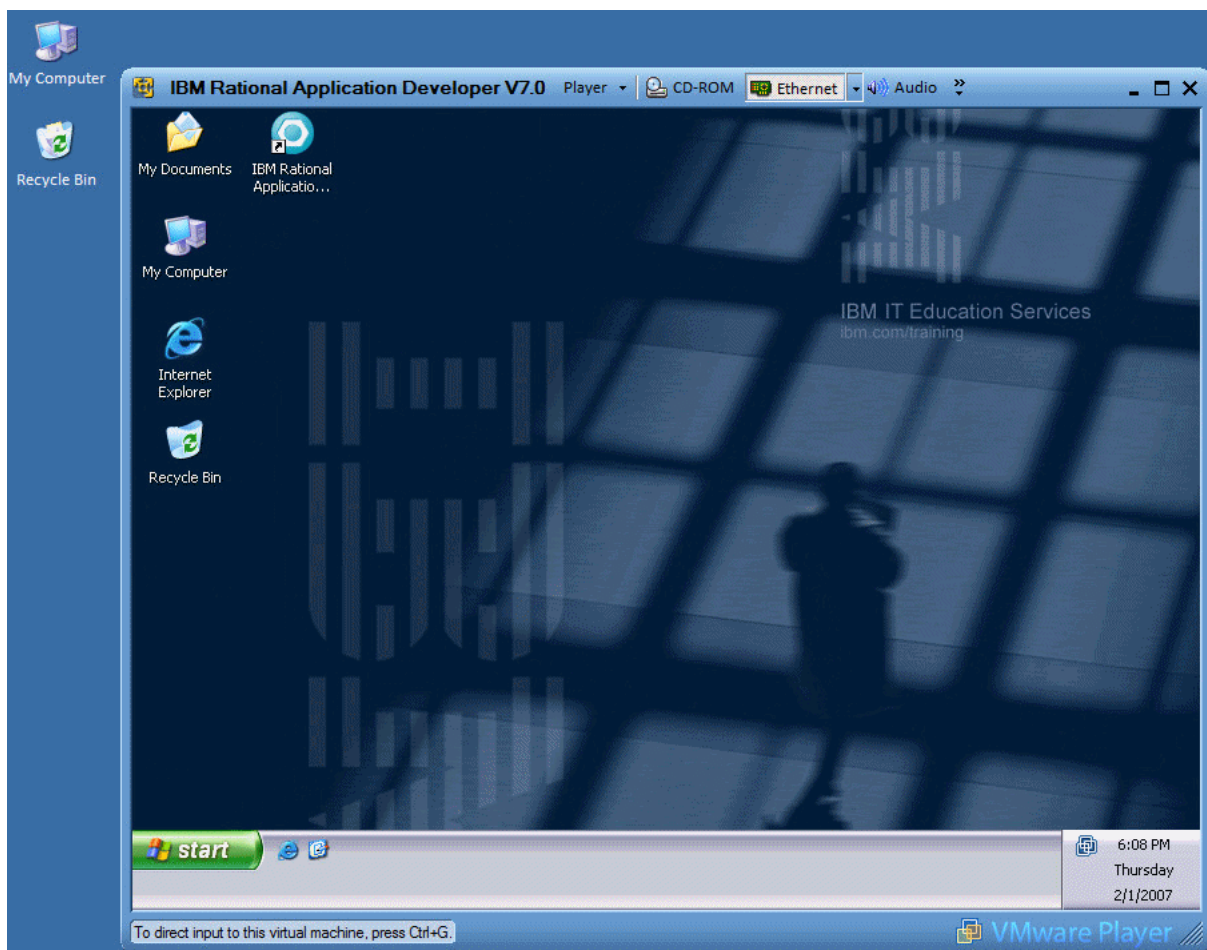
Virtual machines depend on a technology known as *virtualization*. Unlike *emulation*, where hardware components such as the video card or processor are mimicked by software, virtualization maps the actual hardware resources to the virtual machine environment. This scheme ensures a clean separation between the virtual machine and the real computing system, while retaining most of the speed of the application as if it were running natively on the actual computer system.

Virtual machines in the classroom

Virtual machines are ideal for quickly preparing a set of computer workstations with identical software configuration. Instead of completing a lengthy set of installation instructions, the classroom preparer only needs to extract a set of data files that define the virtual machine itself.

Running virtual machines with the VMware Player application

There are several companies that provide virtualization software. WebSphere Education is currently using VMware applications to create, manage, and run virtual machines in classes.

To reduce the software licensing costs to business partners, WebSphere Education courses use a free-of-charge solution, VMware Player. The only requirement placed upon the classroom preparer is the end-user license agreement for the VMware Player software. If the preparer does not agree to the EULA terms, contact the WebSphere Education engagement manager to discuss alternatives to the VMware application.

Additional requirements with VMware Player

In order to map the existing hardware devices to the virtual machine, the VMware Player application requires direct access to the system resources, such as the network adapter.

The following are common issues associated with running a classroom environment with virtual machines and VMware Player software:

- The student workstation needs to support two instances of the operating system, one for the physical (host) workstation and one for the virtual machine (guest). Such a configuration places additional burden on memory and processor resources.

- The VMware Player application relies on custom network drivers. The classroom preparer must have administrator-level privileges within the Windows operating system in order to install the software.

- In **bridged** networking mode, a running copy of the virtual machine (guest) appears as a real computer on the network. Certain classrooms with strict computer network security policies might not allow unauthorized hosts to appear on the network.

If any of these issues arise during the lab setup process, contact the WebSphere Education engagement manager to discuss workarounds.

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